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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/690,021	10/22/2003	Takeshi Kijima	117581	4018

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OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER	
XU, LING X	

ART UNIT	PAPER NUMBER
1775	

DATE MAILED: 08/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/690,021	KIJIMA ET AL.	
	Examiner	Art Unit	
	Ling X. Xu	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) *14-23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-13 and 24-26* is/are rejected.

7)☒ Claim(s) *2 and 3* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/28/04, 10/4/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-13 and 24-26, drawn to a product, classified in class 428, subclass 697.

II. Claims 14-23, drawn to a method, classified in class 427, subclass 126.3.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process such as sputtering rather than by sol-gel methods.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. Philip Caramanica on 8/5/2005 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-13 and 24-26. Affirmation of this election must be made by applicant in replying to this Office action. Claims 14-23 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 24-26 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 5-7 of copending Application No. 10/807,278. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 5-7 of copending application recite a ferroelectric capacitor comprising a lead zirconate titanate niobate complex oxide, which encompasses all the limitations recited in claims 24-26 of the present application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3, 8-13 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 3, the y in the general formula is not defined.

In claim 24, claim 1 is not a method claim.

In claim 8-13, there is insufficient antecedent basis for the limitation for "PZT-family" in the claim.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 10, 12 and 24-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Katsuto et al (JP-2001-080995).

With respect to claim 1, Katsuto discloses a ferroelectric film comprising a formula PbTiaZrb(AgBh)cO$_3$, wherein B is Nb and h is 2/3 and 0.1<=c<=0.04. Accordingly, the amount

of Nb is between 0.03 and 0.07 (h*c, h is 2/3 and 0.1<=c<=0.04), which overlaps the claimed range of 0.05<=x<=1.

With respect to claims 10 and 12, Katsuto discloses a PZT ferroelectric film having a formula ABO_3, such as $Pb(ZrxTi_1-x)O_3$, wherein 0.40<=x<=60 (embodiment [0025]). The amount of Pb vacancy is 0, which is less than 20 mol% of the stoichiometric composition of the ABO_3. In the formula $Pb(ZrxTi_1-x)O_3$, x can be 40, (1-x) can be 60. When 1-x is 60, the Ti composition is higher than Zr.

Katsuto also discloses that the film has a crystal structure of rhombohedral system (abstract).

With respect to claims 24-26, Katsuto discloses that the ferroelectric film is used as a ferroelectric memory, piezoelectric element or semiconductor element (abstract and embodiments [0001]-[0002]).

5. Claims 1, 4-6, 10, 13 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Makoto et al (JP-04-037076).

With respect to claims 1, 4-6, Makoto discloses a ferroelectric film comprising a formula Pb(ZrxTiy(NbaSbbMnc)z)O3, wherein a=1 and z is between 0.08 and 0.1. Accordingly, the amount of Nb is between 0.08 and 0.1(a*z, a=1 and z is between 0.08 and 0.1), which overlaps the claimed range of 0.05<=x<=1 recited in claim 1, the claimed range of 0.1<=x<=0.3 recited in claims 4 and 6, and the claimed range of 0.1<=x<=0.4 recited in claim 5.

With respect to claim 10, Makoto discloses that Pb's vacancy is 0 which is less than 20 mol % of the stoichiometric composition the ABO_3.

It is noted that claim 13 is product-by-process claim. Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps (MPEP 2113). "[E]ven though product – by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 227 USPQ 964, 966.

With respect to claim 25, Makoto discloses that the ferroelectric film is used as a piezoelectric element (abstract).

6. Claims 10-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Ryu et al (J. Am. Ceram. Soc. 84, p902-904 (2001)).

Ryu discloses a PZT ferroelectric film having a formula ABO_3, such as $Pb_{0.988}(Zr_{0.52}Ti_{0.48})_{0.976}Nb_{0.024}O_3$ (page 902). Pb is included in the A site and Zr and Ti are included in the B site. The amount of Pb vacancy is less than 20 mol% of the stoichiometric composition of the ABO_3. Nb is included in the B site with a compositional ratio equivalent to twice the Pb vacancy in the A site in the formula listed above.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Makoto as applied to claims 1, 4-6 above, and further in view of Hase et al. (US 5,279,996).

As stated above, Makoto discloses the same ferroelectric film as recited in claims 1 and 4-6.

Makoto does not disclose the ferroelectric film having a crystal structure as recited in claim 7 and does not disclose the ferroelectric film comprising Si or Si and Ge as recited in claim 8-9.

Hase teaches that a piezoelectric ceramic composition mainly composed of lead titanate zirconate having a crystal structure of tetragonal systems (col. 2, lines 5-20).

Hase also teaches that a small amount of at least one of Si and Ge added to the piezoelectric composition can improve the mechanical strength of the composition (col. 2, lines 5-20).

Therefore, it would have been obvious to one of ordinary skill in the art to add small amount of Si as taught by Hase into the ferroelectric film composition in order to improve the mechanical strength of the composition.

Allowable Subject Matter

8. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 3 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling X. Xu whose telephone number is 571-272-1546. The examiner can normally be reached on 8:00 - 4:30 Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah D. Jones can be reached on 571-272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ling X. Xu
Examiner
Art Unit 1775

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